Remarks/Arguments:

Reconsideration of the application is requested.

Claims 1-21 remain in the application.

In item 2 on page 2 of the above-identified Office action, claim 3 has been rejected as being indefinite under 35 U.S.C. § 112.

More specifically, the Examiner has stated that it is unclear as to exactly how the size of the particle is selected. It is noted that claim 3 is dependent on claim 2, which recites an average size of less than 100 nm in diameter. Claim 3 is dependent on claim 2 and recites "the size". Accordingly claim 3 is believed to be clear and definite. Therefore, claim 3 has not been amended to overcome the rejection.

It is accordingly believed that the specification and the claims meet the requirements of 35 U.S.C. § 112, first and second paragraphs. Should the Examiner find any further objectionable items, counsel would appreciate a telephone call during which the matter may be resolved.

In item 4 on page 3 of the Office action, claims 1-5, 7-10, 12, 13, 16, 17, 20, and 21 have been rejected as being fully anticipated by Kusumoto et al. (EP 0 744 662) (hereinafter "Kusumoto") under 35 U.S.C. § 102.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and the claims have, therefore, not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claims 1 and 20 call for, *inter alia*:

the nanocrystalline particles being configured to absorb light via the quantum size effect.

The most important feature of claims 1 and 20 is not disclosed in any of the references cited by the Examiner. According to the invention, the nanocrystalline particles absorb light via the quantum size effect. According to claim 2 of the instant application, light absorbing particles may preferably have a particle size of less than 100nm. However, it is **not** correct that any particle having a size less than 100nm would absorb

light (in particular UV-light) via the quantum size effect. Instead, particle size and light-absorption via the quantum size effect are two distinct features which are not necessarily directly associated. Accordingly, when assessing the novelty of claims 1 and 20, it is not sufficient to look for the disclosure of the particle size without the disclosure of light-absorption via the quantum size effect.

In item 4 on page 3 of the Office action, the Examiner states that Kusumoto discloses particles of a diameter less than 100nm and then concludes that "thus" the particles absorb light via the quantum size effect. In particular, she refers to page 3, lines 11-30 of Kusumoto. However, Kusumoto only discloses **pigments** (page 3, lines 17 and 19) that are substances which absorb **visible** light thereby being usable for providing a colored surface, this is apparent from the use of words like "yellow lead, zinc yellow, rouge, cadmium red, titanium black, iron black, carbon" etc. (page 3, lines 20-21). Providing a colored surface by using a pigment does not involve absorption of UV-light via the quantum size effect.

Furthermore, Kusumoto discloses that the average particle size of the radiation-absorbable fine particles (pigments) is "not critical" and may be between 1nm and 2μm (page 3, line 26). However, for the quantum size effect, the particle size is

critical because for sizes well above 100nm no quantum size effect will occur. Accordingly, page 3, line 26 of Kusumoto shows that Kusumoto does **not** disclose the quantum size effect (which as pointed out above, depends the particle material and not just on the particle size).

As can be seen from the above-given comments, the Kusumoto reference does not show the nanocrystalline particles being configured to absorb light via the quantum size effect as recited in claims 1 and 20 of the instant application.

Since claims 1 and 20 are believed to be allowable over Kusumoto, dependent claims 2-5, 7-10, 12, 13, 16, 17, and 21 are believed to be allowable over Kusumoto as well.

Even though claims 4 and 5 are believed to be allowable, the following comments pertain to claims 4 and 5.

There is no disclosure in Kusumoto that supports the Examiner's statement with regard to claims 4 and 5, that titanium oxide "will intrinsically generate" the additional energy levels within the band gaps of the matrix substance and that the particles "effect absorption via the quantum size effect." Therefore, the subject matter of claims 4 and 5 **is not** anticipated by Kusumoto.

In item 5 on page 4 of the Office action, claims 1-6, 10, and 16-20 have been rejected as being fully anticipated by Okumura et al. (U.S. Patent No. 5,744,293) (hereinafter "Okumura") under 35 U.S.C. § 102.

Regarding Okumura, in item 5 on page 4 of the Office action, the Examiner stated that the nanocrystalline particles disclosed by Okumura would absorb light via the quantum size effect. However, there is no disclosure in Okumura to support the Examiner's position. Okumura only discloses a particle size of preferably less than 100 Angstrom (10nm), preferably less than 10 Angstrom (1nm) (column 3, line 49). However, as stated above with regard to Kusumoto, providing particles of any arbitrary material having a diameter between 1 and 10nm does not mean that the material of the particles is capable of absorbing light via the quantum size effect. Okumura discloses that **pigments** (like carbon particles) (column 2, lines 43-45) therein.

As can be seen from the above-given comments, the Okumura reference does not show the nanocrystalline particles being configured to absorb light via the quantum size effect as recited in claims 1 and 20 of the instant application.

Since claim 1 is believed to be allowable over Okumura, dependent claims 2-6, 10, and 16-19 are believed to be allowable over Okumura as well.

In item 6 on page 5 of the Office action, claims 1, 10, and 11 have been rejected as being fully anticipated by Nomura (U.S. Patent No. 6,384,318) under 35 U.S.C. § 102.

In item 6 of the Office action, the Examiner referred to Nomura and stated that particles with a diameter of 0.05 microns to 0.3 microns "would exhibit" a quantum size effect. It is respectfully noted that this is not correct. As with respect to Kusumoto and Okumura, Nomura only discloses ranges of particle sizes (column 13, lines 29-31). However, Nomura is silent about the quantum size effect. Furthermore, it is questionable if Nomura discloses a "semiconductor product" at all. Nomura discloses a solar battery module (abstract) having a "substrate" formed by a transparent electrode layer, a semiconductor layer and a back electrode layer (column 1, lines 33-37). Whereas Nomura merely discloses that a semiconductor layer is included in a solar battery, a semiconductor product as recited in claim 1 of the instant application is usually a wafer, a chip, or any other product which is basically formed of a planar support structure made of a semiconductor material

As can be seen from the above-given comments, the Nomura reference does not show the nanocrystalline particles being configured to absorb light via the quantum size effect as recited in claims 1 and 20 of the instant application.

Since claim 1 is believed to be allowable over Nomura, dependent claims 10 and 11 are believed to be allowable over Nomura as well.

In item 8 on page 6 of the Office action, claim 14 has been rejected as being fully anticipated by Kusumoto (EP 0 744 662) under 35 U.S.C. § 102 or in the alternative as obvious over Kusumoto (EP 0 744 662) under 35 U.S.C. § 103. Since claim 1 is believed to be allowable, dependent claim 14 is believed to be allowable as well.

In item 9 on page 7 of the Office action, claim 15 has been rejected as being obvious over Kusumoto (EP 0 744 662) in view of Yamada et al. (EP 0 770 579) (hereinafter "Yamada") under 35 U.S.C. § 103. Yamada does not make up for the deficiencies of Kusumoto. Since claim 1 is believed to be allowable, dependent claim 15 is believed to be allowable as well.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1 or 20. Claims 1 and 20 are, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claims 1 or 20, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-21 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel respectfully requests a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any other fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner & Greenberg P.A., No. 12-1099.

Respectfully submitted,

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For Applicant(s)

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